LISTING OF THE CLAIMS

Claim 1 (original): A substrate processing method for removing an ArF resist film from a substrate having the ArF resist film, comprising the steps of:

irradiating an ultraviolet ray having a predetermined wavelength to the ArF resist film;

altering the ArF resist film irradiated with the ultraviolet ray into a water-soluble state by placing the substrate in a chamber and feeding an ozone gas and water vapor to the chamber; and

removing the ArF resist film from the substrate by feeding pure water to the ArF resist film altered into the water-soluble state.

Claim 2 (original): The substrate processing method according to claim 1, wherein the substrate further has an antireflection film compatible with an ArF ray, and

the antireflection film together with the ArF resist film is irradiated with an ultraviolet ray, becomes water-soluble by said ozone gas and the water vapor, and is collectively removed together with the ArF resist film from the substrate by the pure water.

Claim 3 (original): A substrate processing method for removing an antireflection film from a substrate having said antireflection film, comprising the steps of:

irradiating an ultraviolet ray having a predetermined wavelength to the antireflection film;

altering the antireflection film irradiated with the ultraviolet ray into a water-soluble state by placing the substrate in a chamber and feeding an ozone gas and water vapor to the chamber; and

removing said antireflection film from the substrate by feeding pure water to said reflection film altered into the water-soluble state.

Claim 4 (original): A substrate processing method for removing a resist film from a substrate having the resist film undergone an ion implantation process at a high dose, comprising the steps of:

irradiating an ultraviolet ray having a predetermined wavelength to said resist film;

altering the resist film irradiated with the ultraviolet ray into a water-soluble state by placing the substrate in a chamber and feeding an ozone gas and water vapor to the chamber; and

removing the resist film from the substrate by feeding pure water to the resist film altered into the water-soluble state.

Claim 5 (original): The substrate processing method according to claim 4, wherein a dosage in the ion implantation process is equal to or greater than $1 \times 10^{15}/cm^2$.

Claim 6 (previously presented): The substrate processing method according to claim 1, wherein when the water vapor and the ozone gas are fed to the chamber, a feed amount of ozone gas with respect to the water vapor is decreased while the water vapor is fed to said chamber at a constant flow rate in such a way as not to cause dew condensation on the substrate placed in the chamber.

Claim 7 (original): The substrate processing method according to claim 6, wherein feeding of the ozone gas to the chamber is periodically suspended.

Claim 8 (previously presented): The substrate processing method according to claim 6, wherein a pressure at which dew condensation occurs in the chamber is acquired beforehand, when an amount of the water vapor to be fed to the chamber is made constant with an interior of the chamber held at a predetermined temperature, and

when the water vapor and the ozone gas are fed to the chamber, the feed amount of ozone gas is controlled while a pressure in the chamber is measured in such a way that the measured pressure does not exceed the pressure at which the dew condensation occurs.

Claim 9 (previously presented): The substrate processing method according to claim 1, wherein the chamber is evacuated in such a way as to keep an interior of the chamber at a constant positive pressure when the water vapor and the ozone gas are fed to the chamber.

Claim 10 (original): A substrate processing method for removing an ArF resist film from a substrate having the ArF resist film, comprising the steps of:

irradiating an ultraviolet ray having a predetermined wavelength to the ArF resist film;

altering said ArF resist film irradiated with the ultraviolet ray in such a way as to be water-soluble with a predetermined chemical solution by placing the substrate in a chamber and feeding an ozone gas and water vapor to the chamber; and

removing the ArF resist film from the substrate by feeding the chemical liquid to the altered ArF resist film.

Claim 11 (original): The substrate processing method according to claim 10, wherein the substrate further has an antireflection film compatible with an ArF ray, and

the antireflection film together with the ArF resist film is irradiated with an ultraviolet ray, is altered by the ozone gas and the water vapor, and is collectively removed together with the ArF resist film from the substrate by the chemical solution.

Claim 12 (original): A substrate processing method for removing an antireflection film from a substrate having the antireflection film, comprising the steps of:

irradiating an ultraviolet ray having a predetermined wavelength to the antireflection film;

altering said antireflection film irradiated with the ultraviolet ray in such a way as to be soluble with a predetermined chemical liquid by placing the substrate in a chamber and feeding an ozone gas and water vapor to the chamber; and

removing the antireflection film from the substrate by feeding the chemical liquid to the altered antireflection film.

Claim 13 (original): A substrate processing method for removing a resist film from a substrate having the resist film undergone an ion implantation process at a high dose, comprising the steps of:

irradiating an ultraviolet ray having a predetermined wavelength to the resist film;

altering the resist film irradiated with the ultraviolet ray in such a way as to be soluble with a predetermined chemical liquid by placing said substrate in a chamber and feeding an ozone gas and water vapor to the chamber; and

removing the resist film from the substrate by feeding the chemical liquid to the altered resist film.

Claim 14 (original): The substrate processing method according to claim 13, wherein a dosage in said ion implantation process is equal to or greater than $1 \times 10^{15}/cm^2$.

Claim 15 (previously presented): The substrate processing method according to claim 10, wherein when the water vapor and the ozone gas are fed to the chamber, a feed amount of ozone gas with respect to the water vapor is decreased while the water vapor is fed to the chamber at a constant flow rate in such a way as not to cause dew condensation on the substrate placed in the chamber.

Claim 16 (original): The substrate processing method according to claim 15, wherein feeding of the ozone gas to the chamber is periodically suspended.

Claim 17 (previously presented): The substrate processing method according to claim 15, wherein a pressure at which dew condensation occurs in the chamber is acquired beforehand, when an amount of the water vapor to be fed to the chamber is made constant with an interior of the chamber held at a predetermined temperature, and

when the water vapor and the ozone gas are fed to the chamber, the feed amount of ozone gas is controlled while a pressure in the chamber is measured in such a way that the measured pressure does not exceed the pressure at which the dew condensation occurs.

Claim 18 (previously presented): The substrate processing method according to claim 10, wherein the chamber is evacuated in such a way as to keep an interior of the chamber at a constant positive pressure when the water vapor and the ozone gas are fed to the chamber.

Claim 19 (previously presented): The substrate processing method according to claim 10, wherein the chemical liquid is an alkaline chemical liquid.

Claim 20 (original): The substrate processing method according to claim 19, wherein the alkaline chemical liquid is any one of an APM solution, an ammonium hydroxide aqueous solution, or a tetramethyl ammonium hydroxide (TMAH) aqueous solution.

Claim 21 (previously presented): The substrate processing method according to claim 1, wherein an ultraviolet lamp or an excimer laser with a wavelength of 172 nm to 193 nm is used for ultraviolet irradiation.

Claim 22 (withdrawn): A substrate processing apparatus comprising:

an ultraviolet irradiation section which irradiates an ultraviolet ray to a substrate having any one film of an ArF resist film, an antireflection film, and a high-dose-ion-implanted resist film;

a chamber which has a heating mechanism and retains the substrate irradiated with the ultraviolet ray;

a water vapor feeder which feeds water vapor to the chamber;

an ozone gas feeder which feeds ozone gas to the chamber; and

a control section which controls the chamber, the water vapor feeder, and the ozone gas feeder in such a way that an interior of the chamber retaining the substrate is kept at a predetermined temperature and the water vapor and the ozone gas are fed into the chamber at predetermined flow rates.

Claim 23 (withdrawn): The substrate processing apparatus according to claim 22, wherein when the water vapor and the ozone gas are fed to the chamber, the control section decreases a feed amount of ozone gas into the chamber while feeding the water vapor into the chamber at a constant flow rate in such a way as not to cause dew condensation on the substrate.

Claim 24 (withdrawn): The substrate processing apparatus according to claim 23, wherein when the water vapor and the ozone gas are fed to the chamber, the control section periodically suspends feeding of the ozone gas to the chamber.

Claim 25 (withdrawn): The substrate processing apparatus according to claim 22, further comprising a pressure sensor which measures an internal pressure of the chamber, and

wherein when the water vapor and the ozone gas are fed to the chamber, the control section adjusts the feed amount of ozone gas in such a way that a value measured by the pressure sensor does not exceed a previously-measured pressure at which dew condensation occurs in the chamber when an amount of the water vapor to be fed to the chamber is made constant with an interior of the chamber held at a predetermined temperature.

Claim 26 (withdrawn): The substrate processing apparatus according to claim 25, wherein when the water vapor and the ozone gas are fed to the chamber, the control section evacuates the chamber in such a way as to keep the interior of the chamber at a constant positive pressure.

Claim 27 (withdrawn): The substrate processing apparatus according to claim 22, further comprising a liquid process section which processes the substrate retained in the chamber and processed by the water vapor and ozone gas by using any one of pure water, an APM solution, an ammonium hydroxide aqueous solution, or a tetramethyl ammonium hydroxide (TMAH) aqueous solution.

Claim 28 (withdrawn): The substrate processing apparatus according to claim 22, wherein said ultraviolet irradiation section has an ultraviolet lamp or an excimer laser with a wavelength of 172 nm to 193 nm as an ultraviolet light source.

Claim 29 (original): A computer-readable memory medium having stored a program which causes a computer to controls a substrate processing apparatus which processes a substrate placed in a chamber having a heating mechanism with water vapor and ozone gas to execute the processes of (a) placing a substrate having any one of an ArF resist film, an antireflection film, and a high-dose-ion-implanted resist film, which has undergone an ultraviolet irradiation process in the chamber, (b) keeping an interior of the chamber at a predetermined temperature, and (c) altering the film so as to be soluble with a predetermined process liquid by reducing a feed amount of ozone gas into the chamber while the water vapor is fed into the chamber at a constant flow rate in such a way as not to cause dew condensation on the substrate.

Claim 30 (original): The computer-readable memory medium according to claim 29, wherein the program causes the computer to control the substrate processing apparatus so as to periodically suspend feeding of the ozone gas to the chamber.

Claim 31 (previously presented): The substrate processing method according to claim 3, wherein when the water vapor and the ozone gas are fed to the chamber, a feed amount of ozone gas with respect to the water vapor is decreased while the water vapor is fed to said chamber at a constant flow rate in such a way as not to cause dew condensation on the substrate placed in the chamber.

Claim 32 (previously presented): The substrate processing method according to claim 31, wherein feeding of the ozone gas to the chamber is periodically suspended.

Claim 33 (previously presented): The substrate processing method according to claim 4, wherein when the water vapor and the ozone gas are fed to the chamber, a feed amount of ozone gas with respect to the water vapor is decreased while the water vapor is fed to said chamber at a constant flow rate in such a way as not to cause dew condensation on the substrate placed in the chamber.

Claim 34 (previously presented) The substrate processing method according to claim 33, wherein feeding of the ozone gas to the chamber is periodically suspended.

Claim 35 (previously presented) The substrate processing method according to claim 12, wherein when the water vapor and the ozone gas are fed to the chamber, a feed amount of ozone gas with respect to the water vapor is decreased while the water vapor is fed to the chamber at a constant flow rate in such a way as not to cause dew condensation on the substrate placed in the chamber.

Claim 36 (previously presented) The substrate processing method according to claim 13, wherein when the water vapor and the ozone gas are fed to the chamber, a feed amount of ozone gas with respect to the water vapor is decreased while the water vapor is fed to the chamber at a constant flow rate in such a way as not to cause dew condensation on the substrate placed in the chamber.